

We claim

1. A combination comprising a bed of a particulate copper-containing catalyst and a guard bed of a particulate composition containing a) at least one lead compound, other than lead oxide, that reacts with hydrogen chloride and b) a support therefor.
2. A combination according to claim 1 wherein the lead compound does not undergo significant decomposition when heated for 2 hours at 300°C or reduction to elemental lead when treated with a hydrogen / carbon monoxide mixture at 225°C.
3. A combination according to claim 2 wherein the lead compound is lead nitrate.
4. A combination according to claim 1 wherein the copper-containing catalyst also contains zinc oxide and at least one oxide selected from the group consisting of alumina and chromia.
5. A combination according to claim 4 wherein the catalyst further comprises magnesia
6. A combination according to claim 4 wherein the catalyst further comprises a rare earth oxide.
7. A combination according to claim 1 wherein the particles of the guard bed have maximum and minimum dimensions in the range 1.5 to 20 mm.
8. A combination according claim 1 wherein the support is selected from the group consisting of alumina, chromia, zirconia and titania.
9. A combination according to claim 1 wherein the guard bed particles contain at least 2% by weight of lead.
10. A combination according to claim 1 wherein the guard bed particles are made by impregnating preformed shaped particles of the support with a solution of a lead salt, followed by heating to remove the water.
11. A combination according to claim 1 wherein the guard bed particles are made by precipitating the lead compound in the presence of the support particles followed by heating and forming the precipitated compounds into shaped particles.

12. A combination according to claim 1 wherein the guard bed particles are made by co-precipitating lead and support precursor compounds and thereafter forming the precipitated compounds into shaped particles.
13. A process for performing a catalytic reaction using a bed of a copper-containing catalyst comprising passing a process gas through a guard bed of a particulate composition containing a) at least one lead compound, other than lead oxide, that reacts with hydrogen chloride and b) a support therefor, and then passing said process gas through the bed of copper-containing catalyst.
14. A process according to claim 13 wherein the process gas contains carbon monoxide and steam.
15. A process according to claim 14 wherein the process gas further comprises at least one gas selected from the group consisting of hydrogen, carbon dioxide, methane, and nitrogen.
16. A process according to claim 14 wherein the process gas is passed through the copper-containing bed at an inlet temperature in the range 150 to 250°C.
17. A process according to claim 14 wherein the process gas contains 1 to 4% by volume of carbon monoxide, and at least one mole of steam per mole of carbon monoxide.